

B. dissectum is of very doubtful validity and is probably to be associated with *B. obliquum*. *B. silaifolium* does not seem to develop the *dissectum* form. Gilbert's var. *oneidense* is a peculiar form* which seems to belong with *B. obliquum* although not typical.

The western forms are not nearly as well known as the eastern ones. More complete material may modify their grouping considerably, either by reducing their number, or possibly even by adding to it. Additional material is greatly to be desired with such notes as habitat, time of fruiting, and altitude.

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SEEDLINGS AND ADVENTITIOUS PLANTS OF DROSERA

BY ROBERT GREENLEAF LEAVITT

In TORREYA for May, 1909, Miss Winifred Robinson published some interesting notes on bud-derived individuals of *Drosera rotundifolia* L.; the extraordinary growths springing from upper leaf surfaces while the leaves were still in organic union with the parent plant, and arising even from a flower stalk which had been broken off. References were also made to the literature of the subject; Nitschke's description of seedlings of the above species was cited. The conclusion is reached (p. 95) that "in each species except *D. binata* the first leaves [of adventive plants] resemble those of the adult." It is inferred (p. 89) that seedling foliage of *D. rotundifolia* is different from that of adventives.

Formerly I had for several years various species of *Drosera* in cultivation, raising seedlings or adventives, and often both, from the following species: *D. rotundifolia* L., *D. capillaris* Poir., *D. brevifolia* Pursh, *D. intermedia* Hayne, *D. linearis* Goldie, *D. filiformis* Rafin., *D. filiformis* var. *Tracyi* McFarl., *D. capensis* L., *D. indica* L. and *D. binata* Labill. (with *D. dichotoma* Banks & Solander, if this is distinct). I have seedlings of *D. uniflora* Willd. of Chile. Stages which might be termed adolescent, or

* Penultimate divisions broad, oblong (narrow and lanceolate in typical *obliquum*), the tips broad, usually rounded or blunt, the segments full, the margins plane, more or less finely and irregularly crenulate or bluntly denticulate. (Known from Massachusetts to Illinois.)

perhaps even nepionic, were found on herbarium specimens of other species.

With regard to seedlings of *D. rotundifolia*, of which I have examined many specimens, it seems to me that Nitschke's report is not at all representative. His examination was evidently incidental and the description is cursory. I have found the first foliage leaf blade circular, the five marginal tentacles provided with glands, the disc glands five, the whole entirely Droseraceous. The earliest foliage differs from that of the adult in size, in number and complexity of tentacles, but in no other essential respect that I can see.

When the seed has fallen far down in the moss and the seedling has struggled up to the light, defective leaves may be expected, due to poor illumination. Such were probably those found by Nitschke.

The first leaves of adventives differ, in my observation, only in being more advanced as regards size of blade and number and complexity of tentacles. Their more progressive condition is doubtless due to better food supplies. Were one to experiment with smaller and smaller leaves as sources of adventives, probably the tentacles could be carried back to the stage found in seedlings.

Goebel's observations on *D. binata* (cited p. 94) give rise to the question whether the early rotund leaves of this curious Australian species — the mature leaves of which are sometimes more than a foot high, and as many as six-pronged — may not be near the original form in the genus. I have sought to answer this question from a rather careful survey of the (about) eighty-five species in the genus, from the geographical distribution of the various types of leaf figure, and from a study of developmental stages. The whole matter is palpably speculative. By far the most probable supposition is, however, that a roundish blade was the original type, from which on one side came the elongated forms like *D. filiformis*, and from which on the other came the auriculate leaves of the section *Ergaleium*, and the "two-forked" one of *D. binata*.*

* See Reversionary Stages Experimentally Induced in *Drosera intermedia*, *Rhodor* 5 : 265 (1903).

It is rather interesting to find that Darwin considered this question, and made a diametrically opposite guess. He thought *D. binata* primitive, and the original type of leaf in *Drosera* as elongated.* He did not perceive that these two suppositions are incompatible. The so-called "two-forked" leaf of *D. binata* is not forked — except in the variety *D. dichotoma*, where the lateral arms are often once or twice branched — but the prongs of the leaf are really upturned extremities of an enormously widened blade, this being the very antithesis of the condition in *D. filiformis* (of that in *Byblis* and *Drosophyllum* also).

The round blades exhibited by both seedlings and adventives in this species are probably reversionary to a rotundifoliate ancestor. They appear on mature plants, replacing the "full character" leaves, when the plants are long subjected to a weakening process.

Adventives of *D. binata* do not always show reversionary first leaves, however. Buds on flower stalks and roots, being well nourished, generally produce plants the first leaves of which are crescentiform or fully binate; *i. e.*, of the adult type. This is acceleration of development occasioned by abundant food supply.

The tentacles of youthful leaves of all species are more interesting than the leaf-shapes. A type of marginal tentacle with the gland ventrally, rather than terminally, situated excited my curiosity, for I found it in almost all species studied in their infancy, even when the adult had nothing corresponding to it (*e. g.*, *D. binata*, *D. linearis*, *D. intermedia*, *D. capensis*, *D. filiformis*).† In modified form it is found in adult *D. rotundifolia*, *D. capillaris*, *D. uniflora*, and some other round-leaved species. Its presence in other species is plainly atavistic.

The youthful leaves of *D. intermedia*, *D. capensis*, and *D. linearis* are all round-bladed at first, thus differing from the adult leaves, which are spatulate in *D. intermedia*, linear or linear-lanceolate in *D. capensis*, and linear in *D. linearis*. In *D. filiformis* of Massachusetts nepionic leaves occurred distinctly spatulate and with atavistic marginal tentacles.

In seedlings and adventitious plantlets from leaves and flower

* *Insectivorous Plants*, p. 292. (Authorized Edition, Appleton.)

† This form of tentacle is described in *Rhodora*, *l. c.*, p. 270.

stalks of *D. filiformis* var. *Tracyi* from Georgia, and in seedlings of *D. indica*, I failed to find leaves differing in form or in marginal tentacles from the adult. The tentacles of course were somewhat simpler, but the type was the same. *D. indica* is an oriental caulescent plant with very slender linear leaves.

In conclusion: my observations are to the effect that in all species the earliest foliage leaves are possessed of characteristic Droseraceous features. In this sense, these early leaves are like the adult foliage. Any recapitulation is within the limits of the genus. Cases of deficient organization, or malformation, are excluded.

Secondly, in seedling and adventive *D. intermedia*, in adventive *D. linearis*, in seedling and adventive *D. capensis*, I found reversion to a round blade, in adventive *D. filiformis*, to a spatulate form; and in most species an atavistic condition of the marginal tentacles appears in the youthful leaves.

Thirdly, adventives may differ even within the same species, according to food supply. But in the species studied by me seedlings and adventives from small portions of the adult, as fragments of leaves, flower stalks, and roots, were found to be essentially alike as regards leaf shape and as regards the character of the marginal tentacles.

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LOCAL FLORA NOTES— I

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Under the above title it is proposed to bring before the members of the club problems that are in need of further elucidation. Being primarily problems of distribution they fall more within the province of the active members of the club as a whole than they do upon any one individual, whose precise knowledge of such data must necessarily be limited by the material at hand.

From results already tabulated it becomes increasingly certain that many species credited to all or part of the local flora range, either do not occur at all, or else, occur in such out-of-the-way and little-known localities that collections from them have failed